TECHNOLOGY OUTREACH

Services for Utah-based technology companies and entrepreneurs

As one of the most entrepreneurial states in the nation, Utah has its share of new and growing businesses with potentially market-leading technology under development. However, many up-and-coming companies that show great promise have difficulty focusing on key markets, developing the management "bench strength" to grow, connecting with the early-stage investment community, or finding growth synergies with other companies. Where can some of them turn for help? USTAR's Technology Outreach and Innovation Program (TOIP).

In March 2006, the Utah State Legislature passed Senate Bill 75 creating the Utah Science Technology and Research Initiative (USTAR). In part, this measure invests in world-class innovation teams and facilities at the University of Utah and Utah State University.

Additionally, the legislation created a means for innovation-based businesses anywhere in the state to benefit from targeted assistance through TOIP, with the overall goal of maximizing the economic impact of new technologies in Utah. For more than a year, TOIP has provided dozens of technology innovators and entrepreneurs assistance.

The USTAR team brings diverse expertise and skills to help you meet your technology commercialization and business growth needs. Our management team offers clients a fresh perspective grounded in decades of corporate and public sector experience.

Tech Outreach directors have in-depth knowledge of the businesses and technological needs in their regions, and are good 'economic matchmakers,' connecting the people with innovative technology with the people that can use it or fund it. From a functional standpoint, our management team can help you address the issues your organization faces in:

- Strategic planning
- Operations management
- Human capital and change management
- Financial capital
- Technology deployment
- Marketing and communications
- Intellectual property development

From a vertical industry standpoint, our experts bring a breadth and depth of knowledge in multiple areas, including:

- Biotechnology
- Advanced materials
- Energy
- Recreation
- Consumer
- Healthcare and health sciences
- Financial services

The tools we bring to solving organizational and product development issues include:

- Market opportunity analysis
- Business plans
- Financial investor presentations
- Product launch templates
- Product prototyping
- Brokering contacts to industry

Whether you face challenges in your product, team, or sources of funding, USTAR can provide invaluable insight and guidance.

USTAR supports a wide range of technology-driven innovation, and follows a defined process to determine where to deploy its services for the greatest impact. Contact us to discuss possible engagements.

TOIP teams are located around the state to lend experienced leadership, deep business understanding, and functional expertise to promising opportunities. The program is led by five directors each of whom heads an outreach center located at one of the State's higher educational institutions.

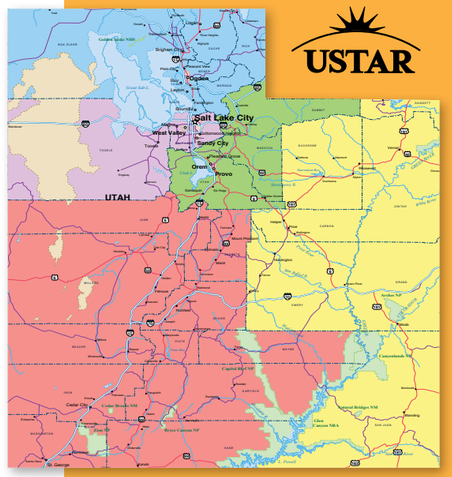
Northern Utah Outreach Center
Center Director: Curt Roberts, 801-626-8940

Salt Lake/Tooele Outreach Center
Center Director: Dr. Suzanne Winters, 801-957-5283

Central Utah Outreach Center
Center Director: Steve Roy, 801-755-9270

Eastern Utah Outreach Center
Center Director: Al Walker, 801-585-9690

Southern Utah Outreach Center
Center Director: Dr. William Pratt, 435-531-1134



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USTAR Connections

USTAR Research: The Bright Side of LIDAR

What is USTAR?

The Utah Science Technology and Research Initiative (USTAR) is a state-funded, long-term effort to strengthen Utah's "knowledge economy," creating high-paying jobs and new businesses. This bold initiative, created by Governor Huntsman and the Utah Legislature, invests in world-class innovation teams and facilities at the University of Utah and Utah State University, then works with the Universities to commercialize the technologies through new business ventures across the state.

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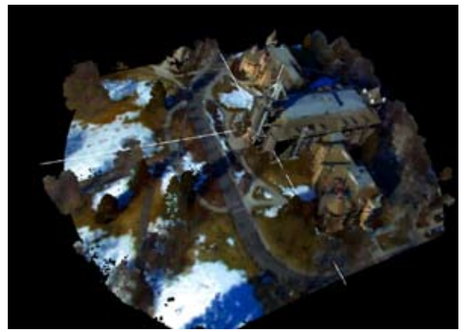
USTAR
Turning innovation into industry.

Lasers are pulses of light, and don't make a sound. Entering the quiet Engineering building at Utah State University (USU), it's hard to sense the amazing research going on behind the lab doors.

The research in question involves a revolutionary technology that would be at home in a futuristic sci-fi thriller. Imagine a plane flying over a burning mountain, sending back a real-time 3D rendering of the entire landscape to assist fire fighters in containing the blaze. Or imagine that same plane flying over a war zone relaying back 3D images of strategic points of interest, enabling generals to reduce risk to troops. This is the future of LIDAR technology according to the staff of USU's Center for Active Sensing and Imaging (CASI).



A 3-D rendering of the Old Main building at the USU campus. The white patches are snow.

LIDAR stands for Light Detection and Ranging. In the past LIDAR has been used for anything from handing out speeding tickets to assisting engineers on construction projects. An early version of the technology that CASI utilizes has been used on UDOT's current I-80 project to speed bridge replacement.

In the midst of the calm and quiet atmosphere is a friendly man excitedly going about his work. Meet Bob Barson, CASI's Executive Director. Barson was brought onto the CASI project because of his 20+ years of industry experience and his desire to help build the technology foundation of Utah. CASI's efforts stem from two applications: LASSI (Laser Assisted Stereo Scopic Imaging) and LARS (Laboratory for Atmospheric and Remote Sensing).

LASSI works by bouncing lasers off of hard surfaces to build 3D models while proprietary software optics apply a photographic image to create the 3D rendering. The result? An exact 3D copy of the object that LASSI has scanned – depth, breadth, colors and all.

Querying Barson about the applications of this technology will lead to a smile and a list long enough to leave even the best auctioneer out of breath. These applications include traffic management, pipeline and land development, and the entertainment industry. "If someone wants to create a 3D

Continued on page 6

Innovation Areas:

Energy

Biomedical Technology

Brain Medicine

Digital Media

Nano-technology

Imaging Technology

USTAR's Three Program Areas

The Utah Science Technology and Research Initiative (USTAR) is a long-term, state-funded investment to strengthen Utah's leadership in the "knowledge economy" and to generate high-paying jobs. Funded in March 2006 by the State Legislature, USTAR is based on three program areas:

All-Star Faculty

The first program area involves funding at the University of Utah and Utah State University to recruit world-class researchers working in billion-dollar markets. USTAR's six key Innovation Development areas are Energy, Biomedical Technology, Brain Medicine, Digital Media, Nanotechnology, and Imaging Technology. This effort is currently budgeted at $15 million a year.

State-of-the-Art Research Facilities

The second area is to build state-of-the-art interdisciplinary research and development facilities at both institutions for the innovation teams. State legislators have created a $161 million USTAR building fund (with a $40 million university match). For details on the two new buildings, see the article below.

Tech Outreach

The third program area involves commercialization teams that work with companies and entrepreneurs across the State. The USTAR Technology Outreach Innovation Program (TOIP) is led by regional directors, who oversee centers based at Weber State University, Utah State University-Uintah Basin, Salt Lake Community College, Utah Valley University, Dixie State College and a satellite office at Southern Utah University. The state has dedicated $4 million annually to support TOIP activities.

USTAR Buildings to Add to State's Innovation Infrastructure

Leading researchers and industry will utilize two state of-the-art interdisciplinary research and development facilities coming to Utah as a result of a key program of the USTAR initiative.

These facilities, one at the University of Utah (U of U) and one at Utah State University (USU), will be used by the recruited research teams working in the initiative's key innovation areas. Each facility will also serve as an industry magnet, encouraging collaboration between USTAR researchers and industry experts.

The USU building has completed the schematic design phase. It is planned to house, among other teams, the researchers pursuing the advanced nutrition and other life sciences projects. This building will be located on the Innovation Campus on the north side of the entire USU complex.

Gramoll Construction has been competitively selected as the Construction Manager General Contractor (CMGC) as was AJC Architects as the Architectural and Engineering (AE) firm and design team lead. The facility's ground breaking took place October 17, 2008. The building is planned to open in 2011.

At the U of U, the CMGC is Layton Construction, Inc. and the AE is Lord Aeck Sargent Architecture (with local collaboration with Prescott Muir). The Design and Construction schedule on the U of U facility has yet to be finalized, however, construction is tentatively set to complete in 2012.

The USTAR facility is part of the U of U's recently updated Campus Master Plan and will anchor a new research complex. The usage needs currently identified include a nanofabrication facility, vivarium, imaging, and brain science facilities, among others.

"We are encouraging our industry contacts to provide feedback on the design of these two innovation centers," Ted McAleer, USTAR Executive Director, said. "The primary purpose of these buildings is to give our all-star teams top-of-the-line facilities in which to conduct their work. The secondary purpose is also critical, and that is to foster the connections between industry, entrepreneurship and research."

"With the right design elements in place, we see these buildings as conduits for new commercialized technology. We hope to see these additions to the state's 'innovation infrastructure' driving an increase in industry-sponsored research, and the creation of new companies and technology license revenue," McAleer continued.

Funding for the projects came in March 2006 when State legislators created a $161 million USTAR building fund. The universities are providing a $40 million match, bringing the entire building budget to $201 million.

For more information on the building projects, contact ustarinfo@utah.gov.

NEW CENTER TO HELP UTAH SMALL BUSINESSES WIN FEDERAL R&D GRANTS

Services Designed to Drive More SBIR/STTR Tech Funding to State

A new resource to help small businesses across the state win a larger share of federal research and development funding became available in June, thanks to the efforts of USTAR, the Governor's Office of Economic Development (GOED), the Small Business Administration (SBA), and the Salt Lake Community College Miller Business Resource Center.

Despite substantial funding available, very few Utah small businesses are successfully pursuing Small Business Innovation Research (SBIR) and Science Technology Transfer and Research (STTR) funding from the U.S. federal government. With participation from 11 separate federal agencies, the SBIR program is the largest source of early-stage technology financing in the U.S., with $2 billion allocated for fiscal year 2008. Nonetheless, in 2004, Utah received only 0.53% of the total dollars awarded nationally for the SBIR program. Another $200 million is available through the related STTR program.

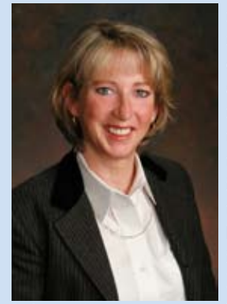
"The Governor's Office of Economic Development works closely with both higher education and the private sector to develop both counseling and funding resources for business. This collaboration with USTAR should help Utah businesses to better navigate the sometimes challenging SBIR/STTR grant process to add another source for critical funding of their businesses," Jason P. Perry, GOED executive director, said.

The SBIR/STTR Assistance Center (SSAC)is based at the Salt Lake Community College Miller Business Resource Center in Sandy. Visit **www.sbir.utah.gov** for details.

"SBA serves as the coordinating agency for the SBIR program nationally. SBIR can provide a crucial stage of funding for small businesses in Utah. We are very excited about the creation of this center which will provide small businesses the ability to access the business and technical assistance needed to successfully qualify for SBIR assistance," said Stan Nakano, SBA District Director.

A main goal of the center is to increase the number and quality of proposals submitted to the federal government. Additionally, training workshops will be offered at locations throughout the state to increase awareness of the SBIR/STTR programs and to improve the writing and grant preparation skills of businesses seeking funding.

"SBIR grants represent an early-stage funding mechanism that doesn't dilute the company founders' equity, as can happen with other early-stage capital vehicles. The SBIR Assistance Center is here to assist local entrepreneurs and businesses take advantage of this funding source, by helping to improve the number and quality of proposals that are submitted," said Dr. Suzanne Winters, Program Director. "The Department of Energy has just released a solicitation, but there are many other federal agencies with their own release dates. It's a matter of matching up the technology to the right grant and producing a quality proposal that addresses the agency's needs."



Dr. Suzanne Winters
Program Director - SBIR/STTR Center

The SBIR program funds early-stage research and development for small businesses. This funding is designed to help stimulate technological innovation and to increase small business participation in federally funded R&D. The STTR program is structured similarly to the SBIR program, but is also designed to facilitate collaboration between small businesses and research institutions (i.e., universities, federally-funded R&D centers, or nonprofit research institutions).

"By providing office space and other resources for the new center, the Salt Lake Community College is once again demonstrating that we're a good partner with the business community," Cynthia Bioteau, SLCC president, said.

Entrepreneurial Progress

In little more than 18 months of technology outreach activity, USTAR has made impressive progress in building entrepreneurial capacity statewide including:

Helping Small Businesses Win Utah's Share of Federal Research Grants – Working with partner agencies and stakeholders, USTAR spearheaded the creation of and manages a new SBIR/STTR grant assistance center that opened in June 2008. (See page 7 above, or visit www.sbir.utah.gov.)

Collaboration Platform – Our website, www.innovationutah.com, offers resources to find complementary research activities, connect with industry, share ideas, and access business management templates.

Support for Investors – Our directors worked with regional economic development partners such as SEED Dixie and SEED Weber Morgan Davis. These efforts lead to the creation of two angel investor groups where none existed before, and the re-invigoration of several existing groups.

The Center for Active Sensing and Imaging Team

The lead researchers on the CASI team are Allen Q. Howard Jr., Alan Marchant, Paul Israelsen, Robert T. Pack, Gail Bingham, Thomas D. Wilkerson, and Brad Petersen. The principle focus of the Center for Active Sensing and Imaging (CASI) at USU is the development of technology using LIDAR for remote sensing and imaging of terrestrial hard targets such as buildings and terrain and atmospheric soft targets like aerosols and particles. The technology applies to a wide range of markets such as land development, architectural surveys, mining, utility corridor survey and mapping, real-world 3D imaging for games and films, environmental remote sensing and monitoring, wind farm siting, and commercial and military intelligence gathering. The team has filed 16 invention disclosures and three patent applications, and had one patent issued. It recently completed four outside service projects for industry.

LIDAR article continued from page 1

rendering of a golf course they've got to spend a quarter of a million dollars and several months hiring surveyors and programmers to build it out. With LASSI you'll pay significantly less and have perfect 3D models in under an hour," Barson says.

LARS is no less exciting. The technology shoots a laser into the air and reports back on the particles floating around. It has already been used in California on several farms to measure dust and equipment emissions. In its current form LARS only reports back on size and number of particles in the air. However, CASI is currently doing research to advance the technology to the point where LARS will be able to tell you what specific types of particles are floating around as well.

"Imagine if fire fighters were able to tell how stable a burning building is by measuring the atmosphere around it, or imagine if Law Enforcement were able to detect meth labs by merely pointing a device around a neighborhood," Barson says.

One of the reasons Barson was brought aboard was to help bring the fruits of CASI to commercialization, an effort that is not without complexities. "This is a new technology and we find we have to push it and explain how cool and cost effective it is. On top of that, when people do find out about it they're unwilling to use it because it isn't 100 percent yet. We are still doing research."

Nonetheless, CASI has been used in several commercial applications already, including developing a 3D model of a development division just northwest of Bear Lake.

The Center was founded in 2007, building upon USU's known strengths in advanced imaging, LIDAR and related technologies. At the time, CASI had a research strategy and successfully licensed technology, but limited funding to secure new equipment and to further develop and commercialize that technology.

Working in conjunction with the university's Technology Commercialization Office, USTAR, the state-funded program aimed at assisting Utah's research universities in commercializing new innovation, helped CASI move forward. CASI put in a proposal, which the university vetted in a competitive screening, and USTAR accepted it. Since the beginning of USTAR's involvement, the technology has gone from being restricted to stationary tripods to being capable of performing from moving vehicles such as cars, trucks and planes.

Bob Barson, Executive Director - CASI

Barson summarizes his experience with USTAR in one sentence: "It was a great match." USTAR was able to help CASI purchase the equipment necessary to build LASSI as well as to enhance LARS. USTAR is also proving instrumental in helping the team develop their business strategy. It is anticipated that a new business will arise from these efforts in a matter of months.

"We were able to help them develop their business plan, seek funding, and do some market analysis for their product," says Christian Volmar, an associate director for USTAR. Volmar's business consulting has helped the team determine which markets CASI should enter and how they should go about it. He agrees with Barson that the relationship is a good fit. "CASI has a great product and USTAR has some resources that will help take that product to the market. The partnership between CASI and USTAR is designed to foster future growth and allow CASI to make the most of future opportunities."

"This will prove to be a win-win-win for the university, for the research team, and for USTAR," USU's vice president for Strategic Ventures and Economic Development Ned M. Weinshenker said. "The collaborative effort is effectively expanding the market opportunity."

Pole, Pedal, Patent?

OGDEN HOSTS OUTDOOR RECREATION INDUSTRY INNOVATION CONTEST

This summer, Ogden City launched the "Concept to Company" contest, to attract new product ideas and companies to Ogden's burgeoning outdoor recreation business environment. With the support of sponsors Zions Bank, Grow Utah Ventures and USTAR, Concept to Company may be the first competition in the nation to focus on spurring innovation in the outdoor recreation products industry.

In the inaugural edition of this annual contest, organizers received more than 120 submissions representing intriguing innovations in a wide range of outdoor sports. The contest is open to any inventor or small business with a product or service idea that applies to skiing, snowboarding, cycling, climbing, hiking, paddling, and other non-motorized, non-fishing or non-hunting sports.

After presentations before a panel of industry experts, the winners were announced on September 26th.

The first place in-state winner was Pressure Products, for their pressurized personal hydration packs known as Pressure Paks. The out-of-state first place winner was AdRax, for a patented bike rack design with advertising space. In-state runners up were WickWerks, for their slip-preventing bike chain, and Rackladder, for their collapsible ladder designed for reaching vehicle rooftop areas.

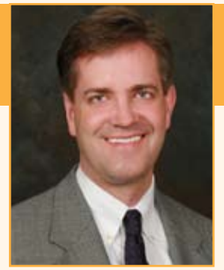
In the in-state track, the winning entry receives a $20,000 award, comprised of cash and the equivalent value in USTAR consulting or prototyping services to help bring the idea to fruition. Two runner-up winners receive $10,000 awards, comprised of cash and services. In the out-of-state track, there is a single award of $20,000 in cash and services, to be awarded by the City of Ogden upon the company's relocation to Utah.

"Ogden has gained a reputation as an outdoor industry-friendly town," Ogden City Mayor Matthew R. Godfrey said. "We want to further that reputation by encouraging creativity and product development that could impact a wide range of sports."

"Contest winners will get a lot of attention from the outdoor recreation industry, and that could lead to increased opportunities in licensing or in the actual launch of some new businesses which is our ultimate goal," T. Craig Bott, president of Grow Utah Ventures, said.

The Concept to Company contest may be unique. "There are a number of product innovation contests around the country, but to the best of our knowledge, this is the first and only one to foster new ideas in outdoor recreation," Curt Roberts, USTAR Northern Utah Regional Technology Outreach Director, said. "We look forward to working with the winners to help them turn their concept into sales revenue, or better yet, into a company."

Industry sponsors of the contest include Amer Sports, Backcountry.com, Black Diamond Inc., Deer Valley® Resort, Descente North America, Goode Ski Technologies, Mountain to Metro, Ogden Climbing Park, Outdoor Industry Association, Petzl America, Rossignol, and SEED Weber/Davis/Morgan.



Roberts' Rules:
Straightforward Business Strategy

Curt Roberts knows a good business strategy when he sees one.

"It can fit on the back of an envelope," he says. "It has to be clear and compelling."

Roberts is USTAR's Northern Utah regional technical outreach director. He's also the vice provost for Innovation and Economic Development at Weber State University. In these complementary roles, he works with dozens of emerging businesses, entrepreneurs, early-stage investors, and other growth stakeholders.

Prior to joining USTAR and WSU, Roberts was a senior executive at Nike, where one of his roles was corporate vice president for global strategy.

"Utah earns high rankings as a pro-business and entrepreneurial environment, so in general, there's a high awareness of what makes a good business proposition," Roberts said. "Nonetheless I still see innovators who miss the mark on their business strategies."

Roberts spells out some straightforward "rules of the road" based on his experience at Nike and in helping grow the Northern Utah technology landscape.

The first principle: less is more. "A lot of strategic thinking is the ability to say no. Good business people can focus on the markets that are most likely to produce gains, to the exclusion of those markets that may be more interesting or fun. You have to be dispassionate and analyze what to tackle first," Roberts says. "In other words, don't have dessert first."

The second principle: idiot-proof the plan. "This is the exercise where you keep it simple. The idea is to take complexity out, whether that complexity resides in your approach to product development, manufacturing, distribution, sales or support. Make the plan simple enough to be executed at low risk by average people."

The third principle: differentiation is everything. "Are you following a fad or copying a competitor? That's not compelling. What's your unique selling proposition?" Roberts notes. "This may be a question of pursuing patents, or positioning your brand. You should orient all your efforts to building that difference and sticking with it."

The fourth principle: look for innovation. "Innovation is increasingly becoming a requirement of being in business. It can come in many forms, not just product. Can you deploy technology to deliver your product more quickly than your competitors? Can you perform service in a way that's a break from the pack?"

The fifth principle: connect the dots. "Align all elements of the strategy so that 1+1=3. This can be looked at from several levels. Perhaps your beachhead is geographic, and you can lock up the market in four different cities before expanding. It can be supply chain-based, where you build on relationships with a handful of key distributors. Cultivate these points of positive growth and extend outward from them."

Lastly, there's the principle of success creates support. "For the investment market, your ability to sell is evidence that your product or service is viable. Bringing in some numbers – even modest ones - changes your proposition from theoretical to actual."

GOOD DEEDS MAKE GOOD BUSINESS AT ARIBEX

Orem-based company benefits from USTAR consulting

A good idea stemming from good intentions is at the root of a growing Orem-based company bringing innovative technology to the dental and veterinary markets.

The flagship product of Aribex, Inc. is the NOMAD handheld x-ray system. Slightly larger than a hairdryer, this battery-powered device uses patented technology to put the power of diagnostic x-rays in a portable package. "Nomad is an innovation that changes the way radiography is done. We're first to market. In fact, we're creating a whole new category in the market," says President and CEO D. Clark Turner, Ph.D.

The idea for the device has humanitarian origins. "Back in 2003, I was employed at Moxtek in Orem, working on miniature x-ray tube technology for future Mars rover missions. A dentist friend of mine mentioned he was going to Russia to do some humanitarian work, and he asked if a portable x-ray device could be designed," Turner says. "We pooled some money and I built a prototype."

Nomad has benefits over bulky, in-place dental x-ray units, Turner says. With in-place units, the dental assistant leaves the room before triggering the device. In the assistant's absence, patients – especially children – tend to fidget, which can require retakes and more exposure to x-rays.

D. Clark Turner, Ph.D.

"With Nomad, the dental assistant stays in the room," Turner says, "That's a more comfortable experience for the patient. The entire process takes about half the time of a normal x-ray, and usually is done in first attempt so there's a lower exposure for the patient."

While the device has benefits for routine dentistry, NOMAD continues to reflect its making-the-world-a-better-place genesis. "One non-profit group called 'Give Kids a Smile' uses our device in inner city schools. They were able to give full dental exams to nearly three thousand kids in just two days. That number of exams would have been impossible without the NOMAD."

Turner adds, "A mobile dental client used one of our units to perform exams on homeless and uninsured people in areas affected by the Katrina Hurricane. We just got a letter from them saying they were able to perform root canal operations on 80 people in four days. That's a lot of teeth saved, thanks to our device."

Turning a good idea and a working prototype into a viable business took some time. In 2004, Turner displayed a prototype at a conference of the American Dental Association. "Dentists would walk by the booth, glance at the NOMAD, stop in their tracks and come back to talk to us. 'This is the coolest thing in the show,' they would tell us."

That conference was a turning point for Turner. "I knew by then we could build the device, and going to that conference showed we could probably sell a lot of them. That's when I quit my other job to start Aribex." With employee number one in 2004, the company has grown to 28 staff in 2008. A number of milestones occurred along that trajectory of growth. "Getting FDA 510(k) clearance in July 2005 was critical. That's when we could really start selling the product."

Other milestones include receiving ISO certification in July 2006, and shipping the 2000th unit in February 2008.

In February 2008, Aribex engaged with USTAR's Technology Outreach and Innovation Program to plot ongoing strategy. Central Utah regional director Steven Roy directed a team of analysts and interns to provide Aribex with preliminary market data on possible medical applications for the device, at no charge to Aribex.

Of more immediate impact was a session that Roy facilitated that helped Turner and other Aribex senior management define the company's strategic direction. Roy used his years of experience in consulting on corporate organizational structure to good effect. "Steve helped us set specific goals and focus on two markets – dental and veterinary," Turner says. "It was a productive day."

Roy agrees. "When you have a breakthrough technology, it's easy to get distracted by the wide range of markets available. Part of the value USTAR offers is to help companies like Aribex define their markets and direct their efforts to the most promising ones. Once a presence in a core market is established, the next opportunity is that much easier to undertake."

Turner speaks well of the assistance USTAR provided. "I would tell the legislature to provide more USTAR funding to helping existing companies grow," he says, adding that he would like to engage with Roy and his team on future efforts, including the possible submission of a federal research and development grant (known as SBIR).

Steve Roy, TOIP Director- Central UT

More recently Aribex worked with USTAR to submit a SBIR federal research grant (see SBIR article on page 7 of this issue.)

"Aribex is an example of a smart approach to growth," Roy says. "Clark and his team have shown a lot of discipline in focusing on their two prime markets. They're building a great base for future expansion."

Turner finds the demands of managing a small but fast-growing company to be challenging. "Growing a company requires cash, so I'm spending a lot of time on financial matters. The chief financial officer duties I handle are what keep me up at night. The fun part of my job remains the chief technology officer aspect. I'm really proud of our innovative technology."

For more information:
www.aribex.com